

Bonding and Sealing Organic Windows



Application Description

Most of the organic glazing materials used in boat building are either clear acrylic sheet (PMMA), widely marketed under trade names such as *Perspex* and *Plexiglas* (the latter manufactured by Rohm and Haas), or polycarbonate (PC), marketed by Bayer GmbH as *Makrolon* and by General Electric as *Lexan* or scratch-proof *Margard*.

All plastic glazing products possess certain characteristics that must be clearly understood before they are installed or bonded with adhesives. In general, incorrectly installed plastic glazing panels are prone to environmental stress cracking (ESC). This can be aggravated by the use of the wrong adhesives.

Plastic glazing products have a higher coefficient of thermal expansion than conventional glass. Therefore, when designing glazing installations, an expansion gap of at least 10 mm all round the periphery must be incorporated between the window rebate and the plastic glazing panel to accommodate thermal movement. Similarly, any clearance holes for fixing screws must be drilled oversize; slightly larger than the diameter of the screw shank.

To minimise the risk of environmental stress cracking, flat sheets of plastic glazing material should be installed completely flat; they should

not be forced to take up a curvature by the use of mechanical fastenings. When the design calls for curved glazing panels, these should be prefabricated to order and properly tempered by a specialist supplier to ensure installation with no resulting stresses.

As many varieties of organic window exist, it is recommended to ensure that the specific grade selected is suitable for use with Sikaflex®-295 UV. Please note that the extruded type of organic glazing (XT) exhibits a higher tendency to environmental stress cracking than the cast type (CS).

Please contact your local Sika Company for technical advice.

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Fig. 122 Examples of one of the many decorative glazing applications inside a luxury liner

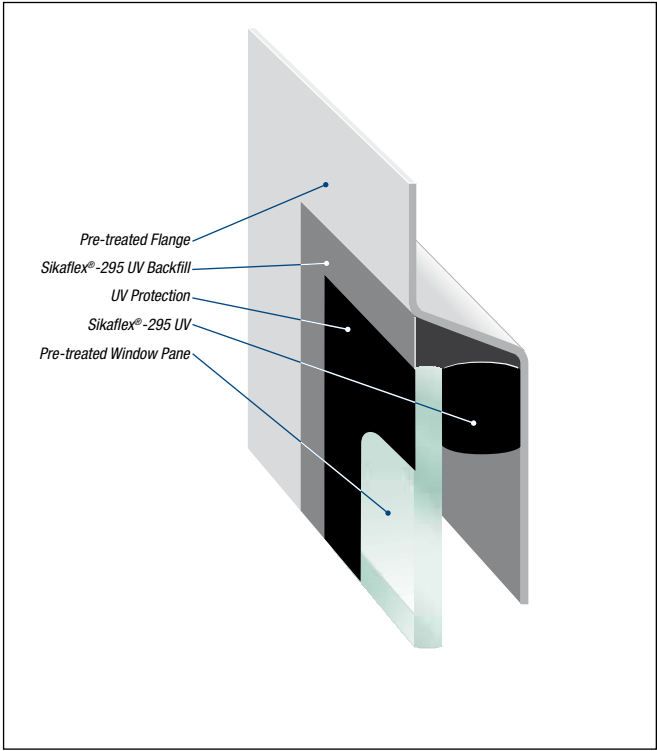


Fig. 124 Typical construction of a window with outer UV protection



Fig. 123 (a, b & c) Examples of adhesively bonded organic glazing using Sikaflex®-295 UV in conjunction with UV Shielding Tape

Procedure for Bonding and Sealing Organic Windows

Substrate Preparation

Fiberglass Frame

	Lightly abrade the gelcoat of the contact area with a very fine sanding pad
	Remove the dust with a vacuum cleaner
	Mask off any areas that need it
 226 Aktivator	Pretreat the substrate with Sika® Aktivator or Sika® Aktivator 205, using a clean, lint-free rag or paper towel. Change the rag frequently! Sika® Aktivator must be applied with the wipe on/wipe off method.
	Flash-off: 10 minutes (min) to 2 hours (max)
 206 G+P 215	Apply a thin, continuous coat of Sika® Primer-206 G+P or Sika® Primer-215, using a clean brush or felt applicator
	Drying time: 30 minutes (min) to 24 hours (max)

Organic Window

	Abrade the bond area with abrasive paper or very fine abrasive pad. Abrade the bonding periphery with 80 grit sandpaper if the organic glazing panel has a scratch proof coating
	Remove the dust with a vacuum cleaner
	Mask off any areas that need it
 226 Aktivator	Pretreat the substrate with Sika® Aktivator or Sika® Aktivator 205, using a clean, lint-free rag or paper towel. Change the rag frequently! Sika® Aktivator must be applied with the wipe on/wipe off method.
	Flash-off: 10 minutes (min) to 2 hours (max)
 209 D	Apply a continuous coat of Sika® Primer-209 D, using a clean brush or felt applicator
	Drying time: 10 minutes (min) to 24 hours (max)

Two-Part Lacquer Coated Frame (Timber or Aluminum)

	Mask off any areas that need it
 205 Aktivator	Pretreat the substrate with with Sika® Aktivator or Sika® Aktivator 205, using a clean, lint-free rag or paper towel. Change the rag frequently! Sika® Aktivator must be applied with the wipe on/wipe off method.
	Flash-off: 10 minutes (min) to 2 hours (max)

 For the preparation of other substrates, please refer to the Primer Chart available at www.sikaindustry.com

Aluminium Frame

	Mask off any areas that need it
	Lightly abrade the contact area with a fine sand pad
	Remove the dust with a vacuum cleaner
 205 Aktivator	Pretreat with with Sika® Aktivator or Sika® Aktivator 205, using a clean, lint-free rag or paper towel. Change the rag frequently! Sika® Aktivator must be applied with the wipe on/wipe off method.
	Flash-off: 10 minutes (min) to 2 hours (max)
 206 G+P 210	Apply a thin, continuous coat of Sika® Primer-206 G+P or Sika® Primer-210, using a clean brush or felt applicator
	Drying time: 10 minutes (min) to 24 hours (max)

Applying Sikaflex®-295 UV Adhesive

	Place spacers in position. Depending on the size of the glazing panel, the thickness of the spacer should be chosen accordingly; approximately 30 Shore A hardness
	Avoid interruption of the bead by the spacers
 295 UV	Apply Sikaflex®-295 UV to the frame rebate or glazing panel using a triangular nozzle with a bead width of at least 10 mm
	Assemble all components within 20 minutes of applying the adhesive
	To prevent slip down of vertical glazing panels, distance blocks (wood or plastic) must be placed in the lower rebate during installation. After curing, these must be removed. The back-fill gap must be at least 10 mm (see Fig. 125)
	Clamps and other fastening aids can be removed after 24 hours. After this time, the expansion gap between glazing panel and the back-fill gap should be filled and completely sealed with Sikaflex®-295 UV. This sealant joint can be tooled to a smooth finish using an appropriate tooling agent. Do NOT use alcohol or alcohol containing solvents. Tooling must be carried out before skinning of the sealant
 295 UV	
 Tooling Agent	
	After tooling remove any masking tape before the adhesive skins over
 208	Uncured Sika adhesives or sealants may be removed with Sika® Remover-208 or mineral spirits
	Do not use Sika® Aktivator, Sika® Aktivator 205, or any other cleaning agent or solvent for cleaning purposes
	If required, apply a commercial UV shielding tape, rubber gasket, or frame

Bond Line Protection

As with conventional glass, plastic glazing panels generally do not protect the adhesive face from damage by UV radiation. Therefore, the bond line must be protected from direct sunlight using one of the methods recommended.

Plastic Windows with a Transmission of >0.5% in UV Range

- External cover strip of appropriate dimensions
- Sika® UV Shielding Tape of appropriate dimensions

Plastic Windows with a Transmission <0.5% in UV Range

- Use ONLY Sika® Primer-209 D

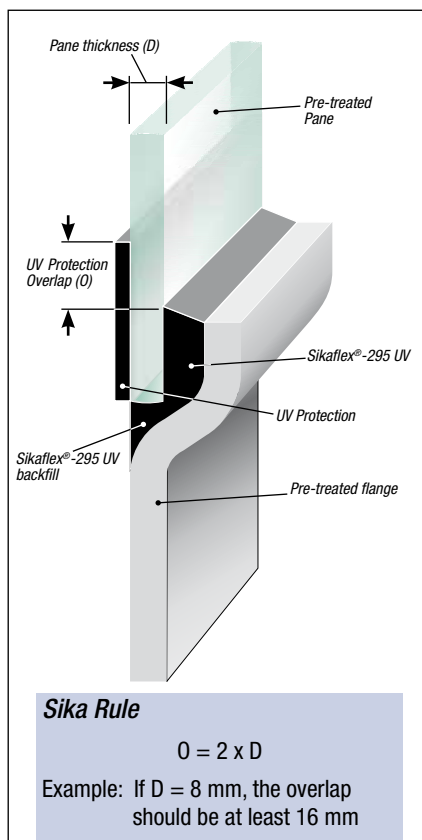


Fig. 125 Minimum Recommendations for UV Bond Line Protection

Window Edge Sealing/Back-filling

Commonly, the edge of the window will be cosmetically finished with Sikaflex® products. The preparation of the surfaces must be identical to that used for bonding. Edge sealing ensures both the prevention of standing water on or near the bond and helps cosmetically finish the window. Fill up the joint completely, ensuring there is no space between the adhesive bead and the joint. The following diagram illustrates the required dimensioning of the back-fill gap for plastic window panels using Sikaflex®-295 UV.

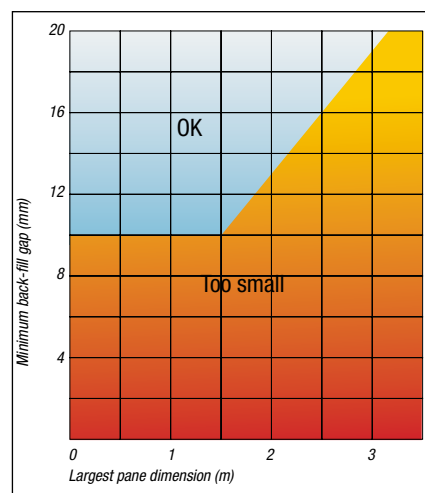


Fig. 126 Back-fill gap to window size ratio

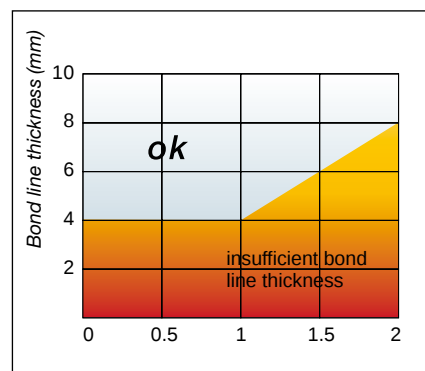


Fig. 127 The bond line thickness to largest pane dimension (m)



Always refer to the current Sika Product Data Sheets and Material Safety Data Sheets obtainable through your local Sika Company